**Patent Claims**

1. Optical inclinometer comprising

- a radiation source (11, 11', 11'') for generating radiation (S), in particular a semiconductor laser or an LED;
- a medium (6, 6'), the optical interface of which is inclination-dependent;
- a detector (3', 3'', 3'''), preferably having a CMOS or CCD microcamera, for recording and converting an image into signals; and
- an evaluation unit (9', 9'', 9''') for determining the inclination;

radiation source (11, 11', 11'') and detector (3', 3'', 3''') being arranged so that the wavefront (WF2, WF3, WF4) is focused indirectly or directly, in reflection and/or transmission, onto the detector (3', 3'', 3''') by means of at least a part of the medium (6, 6');

characterized in that the detector (3', 3'', 3''') has a wavefront sensor or the detector (3', 3'', 3''') is in the form of a wavefront sensor.

2. Optical inclinometer according to Claim 1, characterized in that the medium (6, 6') has an inclination-sensitive surface, in particular is a

liquid.

3. Optical inclinometer according to Claim 1 or 2, characterized in that radiation source (11, 11', 11''', medium (6, 6') and detector (3', 3'', 3''') are arranged so that the radiation (S) is fed substantially perpendicularly to at least one surface of the medium (6, 6') during a passage through the medium (6, 6').

4. Optical inclinometer according to any of the preceding Claims, characterized in that the detector (3', 3'', 3''') has at least one diffractive element (14) which is arranged on an array of microlenses (7).

5. Optical inclinometer according to any of the preceding Claims, characterized in that the detector (3', 3'', 3''') is in the form of a Shack-Hartmann wavefront sensor or has a Shack-Hartmann wavefront sensor.

6. Optical inclinometer according to any of the preceding Claims, characterized in that the detector (3', 3'', 3''') is mounted indirectly or directly on a container containing the medium (6, 6').

7. Optical inclinometer according to any of the preceding Claims, characterized in that the detector (3', 3'', 3''') has a detector surface which resolves in two dimensions, in particular having an orientation of the detector surface

parallel to a surface of the medium (6, 6').

8. Optical inclinometer according to any of the preceding Claims, characterized in that radiation source (11, 11', 11'') and detector (3', 3'', 3''') are arranged on a common base (12, 12'), preferably a circuit board.

9. Optical inclinometer according to Claim 8, characterized in that radiation source (11, 11', 11'') and detector (3', 3'', 3''') are arranged so that the radiation (S) generated is emitted perpendicularly to the surface of the base (12, 12') and the receiving direction of the detector (3', 3'', 3''') is oriented perpendicularly to the surface of the base (12, 12').

10. Optical inclinometer according to any of the preceding Claims, characterized in that at least one deflection element (13', 13'') is arranged in the beam path from the radiation source (11, 11', 11'') to the detector (3', 3'', 3''').

11. Optical inclinometer according to any of the preceding Claims, characterized in that at least one diffractive and/or optical-gradient element (10), in particular a Fresnel lens is arranged in the beam path from the radiation source (11, 11', 11'') to the detector (3', 3'', 3''').

12. Geodetic device, in particular telemeter or plumb staff, having an inclinometer according to any of Claims 1 to 11.

13. Method for measuring the inclination of a device, in particular of a geodetic device, comprising

- a radiation source (11, 11', 11'') for generating radiation (S), in particular a semiconductor laser or an LED;
- a medium (6, 6'), the optical interface of which is inclination-dependent;
- a detector (3', 3'', 3'''), preferably having a CMOS or CCD microcamera, for recording and converting an image into signals; and
- an evaluation unit (9', 9'', 9''') for determining the inclination;

radiation source (11, 11', 11'') and detector (3', 3'', 3''') being arranged so that the wavefront (WF2, WF3, WF4) is focused indirectly or directly, in reflection and/or transmission, onto the detector (3', 3'', 3''') by means of at least a part of the medium (6, 6');

comprising the steps

- focusing of the wavefront (WF2, WF3, WF4) onto the detector (3', 3'', 3'''),
- recording of the signals of the detector (3', 3'', 3'''),

evaluation of the signals and determination of the inclination of the device by the evaluation unit (9', 9'', 9'''),

characterized in that, on evaluation of the signals, information about the wavefront (WF2, WF3, WF4), in particular the form function of the wavefront (WF2, WF3, WF4), is derived.

14. Method according to Claim 13, characterized in that, on evaluation of the signals, an analysis of the deviation of the wavefront (WF2, WF3, WF4) from the wavefront (WF1) before an interaction with the medium is effected.

15. Method according to Claim 13 or 14, characterized in that, on recording of the signals and/or on evaluation of the signals, a reconstruction of the wavefront (WF1) before an interaction of the medium (6, 6') is effected.

16. Method according to any of Claims 13 to 15, characterized in that, on recording of the signals and/or on evaluation of the signals, individual image points of the detector (3', 3'', 3''') are selected, preferably only these image points being used for determining the inclination of the device.

17. Method according to any of Claims 13 to 16, characterized in that, on evaluation of the signals, the form function is derived by means of a polynomial approach, in particular using Zernike

polynomials.

18. Method according to any of Claims 13 to 17, characterized in that, on recording of the signals and/or on evaluation of the signals, different apertures are correlated with one another.

19. Use of a method according to any of Claims 13 to 18 for compensating vibrations and/or random fluctuations of at least one surface of the medium (6, 6'), in particular owing to convection processes.

20. Wavefront sensor for use in an optical inclinometer according to any of Claims 1 to 12, comprising

- a camera (8), preferably comprising a CMOS or CCD microcamera, for recording and converting an image into signals; and
- an array of microlenses (7)

characterized in that at least one diffractive element (14) is coordinated with the array of microlenses (7).

21. Wavefront sensor according to Claim 20, characterized in that the diffractive element (14) is a hologram or a grating, in particular a Dammann grating.